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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 09/929,961 | 08/15/2001 | Frank Duvinage | MB 406 | 2156 |
| 27956 | 7590 | 01/03/2006 | EXAMINER | |
| KLAUS J. BACH 4407 TWIN OAKS DRIVE MURRYSVILLE, PA 15668 | | | TRAN, HIEN THI | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1764 | |

DATE MAILED: 01/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | | |
|------------------------------|------------------------|--|---------------------|--|
| Office Action Summary | Application No. | | Applicant(s) | |
| | 09/929,961 | | DUVINAGE ET AL. | |
| | Examiner | | Art Unit | |
| | Hien Tran | | 1764 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10/3/05 & 9/15/05.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6, 7 and 10-19 is/are pending in the application.
- 4a) Of the above claim(s) 6 and 7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 6-7, 10-19 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 October 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 14-16, 18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Specifically, in claims 14 and 18, the recited language is nowhere disclosed in the instant specification.

In claim 15, it is unclear as to where it is disclosed in the original specification. See claim 16 likewise.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 10-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 10, it is unclear as to what applicants are attempting to recite; the preamble recites a diesel engine, however, the claim lacks means to perform the functions of the diesel engine and therefore the claim is incomplete and non-function.

In claim 11, line 2 it is unclear as to whether the oxidation catalytic converter (6) is the same as to the oxidation catalytic converter (4, 6) set forth in claim 10, line 6.

In claim 12, line 2 it is unclear as to whether the oxidation catalytic converter (4) is the same as to the oxidation catalytic converter (4, 6) set forth in claim 10, line 6.

In claim 14, it is unclear as to where it is disclosed in the specification. Furthermore, since the elements in the claim, e.g. “means for heating ...” is written in a “means-plus-function” format, it must be interpreted as corresponding structure described in the specification or the equivalents thereof consistent with 35 U.S.C. 112, sixth paragraph. *In re Donaldson*, 16 F.3d 1189, 1193, 29 USPQ 1845, 1848 (Fed. Cir. 1994) (en banc). However, since the instant specification does not disclose adequate structures corresponding to each of the claimed elements and the equivalents for performing the recited functions, it is impossible to determine the structure of the claimed elements and the equivalents thereof, as required by 35 U.S.C. 112, sixth paragraph. See *Ex parte Klumb*, 159 USPQ 694 (Bd. App. 1967). See claims 15-16 likewise.

In claim 15, the language of the claim is directed to method limitation which renders the claim vague and indefinite as it is unclear as to what structural limitation applicants are attempting to recite. See claim 16 likewise.

In claim 17, lines 4-12 the language of the claim is directed to method limitation, which renders the claim vague and indefinite as it is unclear as to what applicants are attempting to recite; in lines 9-10 “the particle filter (5)” has no clear antecedent basis and also “sufficiently hot” are relative terms and therefore is vague and indefinite; in line 11 “the particles” has no clear antecedent basis.

In claim 18 it is unclear as to where it is disclosed in the original specification.

In claim 19, line 2 it is unclear as to where the “first sensors” are disclosed in the specification, also the “first sensors (3)” has no clear antecedent basis and it is unclear as to how the first sensors (3) are related to the nitrogen oxide storage device (3) in line 3; in lines 4-5, 8 “the lambda value”, “the nitrogen oxide content”, “the temperature”, the “pressure” have no clear antecedent basis; in lines 9-12 “the exit end”, “the oxygen and nitrogen content” has no clear antecedent basis.

Claim Objections

5. Claims 10-19 are objected to because of the following informalities:

In claim 10, line 1 “Diesel” should be changed to --diesel--. See claims 11-19 likewise.

Appropriate correction is required.

Drawings

6. The drawings are objected to because in newly submitted Fig. 5, the exhaust gas recirculation and the additional fuel injector are nowhere disclosed in the original specification. Note that page 9 of the instant specification discloses that there is an additional injection of fuel into the diesel engine. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be

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necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

7. The drawings have not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the drawings to comply with CFR 1.84(p)(5), e.g. they should include the reference sign(s) mentioned in the specification and vice versa.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claims 10-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Khair et al (6,293,096) in view of WO 00/21647.

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With respect to claims 10-12, 17, Khair et al discloses an exhaust gas cleaning unit for diesel engine of a motor vehicle comprising: a particle filter 32; and a nitrogen oxide store 22 being disposed upstream of the particle filter 32 for removing nitrogen oxides from the exhaust gas before the exhaust gas reaches the particle filter 32; and an oxidation catalytic converter 14 arranged upstream of the nitrogen oxide store.

The apparatus of Khair et al is substantially the same as that of the instant claim, but fails to disclose whether an oxidation catalytic converter may be provided downstream of the nitrogen oxide store or filter or between the nitrogen oxide store and filter.

However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide more than one oxidation catalytic converter in the apparatus of Khair et al so as to further purify the exhaust gas thereof, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

It would have been obvious to one having ordinary skill in the art to select an appropriate location for the oxidation catalytic converters in the apparatus of Khair et al so as to purify the exhaust gas thereof, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

In any event, WO 00/21647 discloses the conventionality of providing more than one catalytic converter 14, 30, wherein the oxidation catalyst converter 30 is located downstream of the nitrogen oxide store.

It would have been obvious to one having ordinary skill in the art to provide another catalytic converter downstream of the nitrogen oxide store as taught by WO 00/21647 in the

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apparatus of Khair et al so as to further convert the pollutants which still remained in the exhaust gas thereof.

With respect to claim 13, Khair et al discloses that the filter has a soot oxidation function, but is silent as to whether a coating may be provided to perform said soot oxidation function.

However, WO 00/21647 discloses the conventionality of providing a filter having a coating of alumina and catalyst.

It would have been obvious to one having ordinary skill in the art to provide a coating as taught by WO 00/21647 in the apparatus of Khair et al so as to assist the converting of soot particles.

With respect to claims 14-18, as discussed in the 112 rejection above, the newly added claims introduce new matter. Therefore, the difference between applicants' claim and that of the prior art cannot be identified by the specification of the instant application. As best understood, Khair et al discloses means for regenerating the nitrogen oxide store, such as the injector 40. Also, WO '647 discloses means for regenerating the nitrogen oxide store, such as the injector 18 or electric heating , etc. (see, for example, page 5, line 4 to page 6, line 21).

It would have been an obvious matter of design choice to select an appropriate means for regenerating the nitrogen oxide store as taught by WO '647 in the apparatus of Khair et al, since such a modification would have involved a mere substitution of known equivalent structures and since WO '647 teaches that a variety of means for regenerating nitrogen oxide store. A substitution of known equivalent structures is generally recognized as being within the level of ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423

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(CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958).

11. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Khair et al (6,293,096) in view of WO 00/21647 as applied to claims 10-18 above and further in view of Strehlau et al (6,089,015) or Held (6,531,099).

With respect to claim 19, Khair et al discloses provision of using a sensor 50, 150, downstream of the filter and nitrogen oxide store for sensing nitrogen oxide content, but is silent as to whether more than one may be provided and the specific type of the sensor, e.g. a lambda probe.

However, WO '647 discloses provision of a plurality of sensors in the system (see, for example, page 6, line 32 to page 7, line 5). Strehlau et al and Held disclose the conventionality of providing lambda probes in controlling the purification system.

It would have been obvious to one having ordinary skill in the art to select an appropriate sensor, such as lambda probe, in controlling the purification system of Khair et al as taught by Strehlau et al or Held, as use of such is conventional in the art and no cause for patentability here.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide more than one sensor as evidenced by WO '647, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to select an appropriate location for each sensor, since it has been held that

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rearranging parts of an invention involves only routine skill in the art. In re Japikse, 86 USPQ 70.

12. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 835,684 in view of WO 00/21647.

With respect to claims 10-13, EP 835,684 discloses an exhaust gas cleaning unit for diesel engine of a motor vehicle comprising: an oxidation catalyst, e.g. a first catalyst (see, for example, col. 1, lines 55-58; col. 2, lines 9-11); a particle filter, e.g. a second catalyst (see, for example, col. 2, lines 3-4); and a nitrogen oxide store being disposed upstream of the particle filter, e.g. the second catalyst (col. 2, lines 44-49); the filter including a coating of noble metal or three-way catalyst, such as platinum (see, for example, col. 1, lines 3-7; col. 2, lines 3-12, 32-40, 44-49, etc.).

The same comments with respect to WO 00/21647 apply.

With respect to claims 14-18, WO 00/21647 discloses provision of means for regenerating the nitrogen oxide store, such as the injector 18 or electric heating, etc. (see, for example, page 5, line 4 to page 6, line 21).

It would have been obvious to one having ordinary skill in the art to provide the means for regenerating the nitrogen oxide store as taught by WO 00/21647 in the apparatus of EP 835,684 so as to assist the regeneration of the NOx trap.

13. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over by EP 835,684 in view of WO 00/21647 as applied to claims 1-18 above and further in view of Strehlau et al (6,089,015) or Held (6,531,099).

The same comments with respect to WO /647, Strehlau et al and Held apply.

Response to Arguments

14. Applicant's remarks filed 9/15/05 have been fully considered but are moot in view of the new ground(s) of rejection.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hien Tran whose telephone number is (571) 272-1454. The examiner can normally be reached on Tuesday-Friday from 7:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1454. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hien Tran

**Hien Tran
Primary Examiner
Art Unit 1764**

HT
December 27, 2005